CDM Smith

Memorandum

To: *Mr. Mike Cirian, P.E., EPA Remedial Project Manager*

From: *August Welch, Damon Repine, Sean Coan*

Date: *May 31, 2016*

Subject: Weekly Onsite Technical Review Report #3 for CFAC RI/FS Phase I - Week Ending 5/27/16

The following memo summarizes CDM Smith's on-site technical review of the Phase I RI/FS work being conducted at the Columbia Falls Aluminum Plant (CFAC). The technical memorandum is organized by a summary of site activities, a summary of the items discussed during the on-site progress meeting, a summary of open items or issues that require further discussion with the EPA, a summary of previously open items which have been addressed and a photographic narrative.

Site Activities

Below is a summary of the site activities observed by CDM Smith during the drilling and sampling work performed by Roux Associates, Inc. (Roux) from May 25 through May 27, 2016.

- On May 25, Roux began sonic drilling at the deep monitoring well location CFMW-19A, located to the southwest of the Wet Scrubber Sludge Pond. The water table aquifer was encountered at approximately 68 feet below ground surface (bgs) and the bottom of the first water bearing unit was at approximately 112 feet bgs. The first water bearing unit consists primarily of well graded sandy gravel and poorly graded clean sand encountered in some areas. The first water bearing unit, containing the water table aquifer, is underlain by a dense, dry, till-like deposit from 112 feet bgs to approximately 198 feet bgs. The second water bearing unit is present from approximately 198 feet to 236 feet bgs. The second water bearing unit consists primarily of well graded sandy gravel or gravelly sand with varying silt content. The second aquifer is underlain by a dense, dry till-like deposit from 236 feet to 297 feet. It appears that a third water bearing unit is present at 297 feet. The boring was terminated at 300 feet bgs on May 27. The well was set in the second aquifer at 220 feet and is screened from 210 to 220 feet bgs.

- On May 25, an onsite meeting to discuss the RI/FS progress was conducted on site and attended by Mike Cirian (EPA), Mark Hall and Colleen Owen (Montana DEQ), Andrew Baris and Michael Ritorto (Roux), Steve Wright (CFAC) and August Welch (CDM Smith). A summary of the items discussed during the meeting is provided under a separate sub-heading below.

- On May 26, Roux began drilling the direct push technology (DPT) borings in the rectifier yard. Each boring was completed to approximately 15 feet bgs.

- On May 27, Roux resumed drilling with the second limited access sonic rig at the water table well location CFMW-10, located to the west of the East Landfill.

- On May 27, Roger Hoogerheide (EPA) visited the site to take a tour of the site.

On Site Meeting

The following items were discussed during the on-site meeting attended by EPA, Montana DEQ, Roux, CFAC and CDM Smith.

- Soil analytical data is being submitted on a 10 day turn-around-time (TAT) and data validation is expected to take approximately 3 weeks to complete once the data is received. First analytical data expected to be made available in late June.

- EPA and CDM Smith recommended that the DPT rig be used to try and advance soil gas probes for screening in the landfill areas that were not screened during the soil gas screening phase of the work. Soil gas screening was not completed in the Sanitary and Industrial Landfills and soil gas screening in the West Landfill was only completed via the landfill vents of which construction details are not known. Roux agreed to use the DPT rig to try and advance test boreholes in the West, Sanitary and Industrial Landfills. If successful in advancing boreholes to 5 feet bgs in these areas, then soil gas probes will be installed in these areas to complete the soil gas screening phase of the work plan. CDM Smith noted that the number of wells planned for installation in the downgradient areas around the landfills is few in number, provides limited spatial distribution and does not allow for determination of the hydraulic gradient in the areas of key landfills. EPA recommends that data obtained from groundwater monitoring conducted during Phase 1 be used to determine the location of additional wells during the Phase 2 portion of the RI/FS.

- Roux is planning adding a surface water sample in the area to the northwest of the West Landfill where overflow runoff in a seasonal creek has flooded the field.

- Roux is planning to add a monitoring well in the southeast portion of the Former Drum Storage area where passive soil gas probes indicated the presence of tetrachloroethene (PCE) in soil gas. The well is planned to be installed in the water table aquifer with a screened interval similar to the other shallow wells located nearby.

- Roux is planning to remove all of the old well pumps in the existing wells and have Cascade Drilling re-develop all of the existing wells so that low flow purge and sample methods can be employed.

- Roux is planning to drop the extraction wells from the sampling program because the wells are not accessible. EPA and Montana DEQA have requested that Roux compile construction details and historical sampling data from the wells for review prior to formally removing the wells from the Phase I sampling program.

- Montana DEQ raised the question of if sub-slab sampling in the basements will be performed following removal of the pot lines and prior to backfilling the basements with crushed concrete. Roux responded by saying that the schedule of removing the pot liners is further out than the expected duration of the Phase I RI/FS. Roux does not believe it would be a problem to drill through the crushed concrete backfill provided all rebar is removed prior to backfilling. Sampling beneath the main plant area will be revisited during Phase 2 depending on the data obtained from wells installed during Phase 1.

Open Action Items/Further Discussion with EPA Needed

The following items are considered open action items or issues that require further discussion with the EPA RPM:

- Roux shall compile well construction details and historical sampling data from the extraction wells that are not accessible. Based on a review of the well construction details and historical data, a decision can then be made to formally remove the wells from the sampling program or install new wells if additional data is needed.

- A third aquifer appears to be present at a depth of approximately 300 feet bgs. Further discussion with Roux is needed to determine the data quality objectives of the deep wells planned for installation at the site. CDM Smith recommends that the planned deep wells be installed in the second aquifer. Per CDM Smith's discussions with Roux field personnel, drilling at the deep well locations shall continue through the second aquifer until the lower confining unit is encountered and then the borehole will be grouted up and the well screened in the upper portion of the second aquifer. If contamination is present in the second aquifer then the need for further exploration of the third aquifer may be warranted during the Phase 2 work.

- Roux shall use DPT rig to advance test borings to 5 feet bgs in the West, Sanitary and Industrial Landfill areas to determine if it is feasible to complete soil gas screening in these areas. If test borings are able to be completed to 5 feet bgs in these areas, then soil gas screening will be conducted in these areas as outlined in the sampling and analysis plan (SAP).

Previously Open Items That Have Been Addressed

The following items were previously identified as open issues and have been adequately addressed through discussions with Roux field personnel:

- Health and Safety concerns of using a pocket knife to open the poly sampling bags on the sonic drill has been addressed. Cascade drilling has supplied a hook knife with a guard that is designed for cutting open sample bags.

- Hydrometrics was observed to be following the SOP during the collection of soil samples for volatiles by collecting the EPA 5035 Method soil aliquots directly from the acetate sample liner prior to homogenizing the sampling depth interval in a plastic bag.
- Roux is following their SOP with regard to lithologic logs being recorded in the field log book.
- The use of drillings fluids (water), if used, will be recorded in the field log book with an estimated volume of water used and a reason that the water was used downhole during drilling.

Photographic Narrative

A brief description of each attached photograph is provided as follows:

1. 20160525_CFAC_(1): Photograph of the coarse grained soil in the first water bearing zone at 76 feet bgs in the deep well CFMW-19A.
2. 20160525_CFAC_(8): Close-up photograph of the coarse grained soil in the first water bearing zone at CFMW-19A. Note the well graded (poorly sorted) nature of the grain size distribution.
3. 20160525_CFAC_(13): Photograph of the soil core from approximately 126 feet bgs at CFMW-19A. The deposit is interpreted as a till-like deposit that underlies the first water bearing zone and perches the water table on top of it.
4. 20160525_CFAC_(14): Photograph of the field to the northwest of the West Landfill that is flooded by a seasonal creek overflow. This area will be added to Roux's surface water sampling program.
5. 20160526_CFAC_(1): Photograph of the DPT rig drilling in the rectifier yard. Sampling in this area includes additional analysis for PCBs and dioxins/furans.
6. 20160526_CFAC_(4): Photograph of the soil core from CFMW-19A from 182 feet bgs. The tight sandy clay soil forms a confining layer between the first and second aquifer. The deposit is interpreted as an interglacial lake deposit.
7. 20160526_CFAC_(6): Cross sectional view of the soil core from CFMW-19A at 182 feet bgs. The fine grained sediment contains fine gravels that are interpreted as drop stones deposited from floating ice.
8. 20160526_CFAC_(7): Photograph of the soil core from CFMW-19A at 212 feet bgs. This represents the second water bearing zone and is interpreted as a glacio-fluvial deposit.
9. 20160527_CFAC_(1): Photograph of the surface completion (yellow stick-up) of the newly installed deep monitoring well CFMW-12A located to the west of the Wet Scrubber Sludge Pond.

10. 20160527_CFAC_(7): Photograph of the soil core from 287 feet bgs at CFMW-19A. This is interpreted as a till-like deposit and separates the second and third water bearing zones.

11. 20160527_CFAC_(10): Photograph of the soil core from 300 feet bgs at CFMW-19A. The soil contains significant moisture and is considered to be a possible third water bearing zone. The boring was terminated at 300 feet bgs and the well was installed in the second water bearing zone at 220 feet bgs.

12. 20160527_CFAC_(11): Close-up photograph of the soil core at 298 feet bgs at CFMW-19A showing the soil moisture present in the formation.

Oversight Schedule

The upcoming schedule for oversight is as follows:

- Roux is planning a scheduled week off during the week of June 6th.
- CDM Smith is planning the next site visit during the week of June 13th.
- CDM Smith will continue to stay in communication with Roux personnel and oversight services on an as-needed basis.

Attachments:

Photographs